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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue  
Seattle, Washington 98101

OCT 10 1989

Reply To  
Attn Of: ECL-115

**Subject: Source Control Actions in Middle Waterway  
Milestones 3 and 4 Source Control Status Reports for the  
Middle Waterway Problem Area  
Commencement Bay Nearshore/Tideflats Superfund Site**

To Interested Parties:

The purpose of this letter is to transmit to you two recent Source Control Status Reports for the Middle Waterway at the Commencement Bay Nearshore/Tideflats (CB/NT) Superfund Site, Tacoma, Washington. The enclosed reports present results of the Washington Department of Ecology's (Ecology) efforts to address facilities and properties that are ongoing sources of contamination to the Middle Waterway Problem Area. These reports may be of interest to you because it may contain information relevant to a property or facility associated with you.

These reports are being provided by the U.S. Environmental Protection Agency (EPA) to all interested parties, including members of the public, community groups, Natural Resource Trustees, and owners and operators of properties or facilities near the Middle Waterway.

**Background**

As outlined in the CB/NT Record of Decision (ROD) dated September 1989, EPA and Ecology are coordinating efforts to clean up contamination at the CB/NT site. The cleanup plan involves a two-phase approach that is being implemented in eight problem areas identified at the site. For each problem area, the cleanup plan requires that releases of contaminants to the marine environment be eliminated or reduced to an acceptable level. Once the sources of contaminants have been regulated, marine sediment cleanup activities will be initiated. The CB/NT ROD identifies Ecology as the lead agency for source identification and source control, and EPA as the lead agency for cleaning up contaminated marine sediments. Ecology's Commencement Bay Urban Bay Action Team (UBAT), which is part of the Toxics Cleanup Program at Ecology's Southwest Regional Office, has primary responsibilities for implementing source control at the site.

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Ecology's source control efforts at the CB/NT site initially focus on identifying the facilities or sites that may release contaminants, and determining whether those facilities or sites are potential or confirmed ongoing sources of problem chemicals to a problem area. After identifying an ongoing source, facility-specific cleanup measures are implemented to control the release of contaminants to the marine environment and to ensure compliance with environmental regulations. Source identification and source control efforts do not focus on historical sources that have already ceased discharges of contaminants to the environment, except as required by ongoing monitoring programs.

In March 1994, EPA sent you a copy of the Milestone 1 Source Control Status Report that documented all potential and confirmed ongoing sources of problem chemicals to the Middle Waterway Problem Area. At that time, EPA also sent you a copy of the Milestone 2 Source Control Status Report that documented all essential administrative actions (e.g., permits, decrees) that are in place to address all ongoing major sources of problem chemicals to the Middle Waterway Problem Area.

### **Milestone 3 Source Control Status Report**

The enclosed Milestone 3 Source Control Status Report documents the achievement of a third source control milestone in the Middle Waterway Problem Area. **Milestone 3 is achieved when essential source control is complete for the major ongoing sources of problem chemicals to a problem area.** Further definition and implications of Milestone 3 are described in EPA's Source Control Strategy Report (May 1992).

### **Milestone 4 Source Control Status Report**

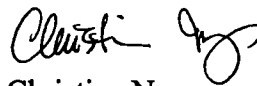
The enclosed Milestone 4 Source Control Status Report documents the achievement of a fourth source control milestone in the Middle Waterway Problem Area. **Milestone 4 is achieved when administrative actions (i.e., orders, permits, decrees) are in place to address all confirmed ongoing sources of problem chemicals in a problem area.** Administrative actions are those actions that must be in place to ensure that all sources of problem chemicals to a problem area will be controlled so that sediment recontamination would not be expected to occur after the action is completed (i.e., after the source is controlled). Further definition and implications of Milestone 4 are described in EPA's Source Control Strategy Report (May 1992; pp. 47-48).

The achievement of Milestone 4 in the Middle Waterway problem area concludes an important step in the overall CB/NT cleanup strategy. At this point, source control activities have progressed sufficiently so that sediment remedial design activities could begin. As part of sediment remedial design, sampling activities would occur to more precisely characterize the contaminated area, including the area expected to recover through natural processes and determining the approximate volume to be remediated.

We would like to emphasize that Ecology's Status Reports for Source Control Milestone 3 and 4 only describe Ecology's efforts to identify, control and/or eliminate **ongoing** sources of problem chemicals to the Middle Waterway. Thus, **the lists of facilities and sites included in the Ecology Status Report should not be confused with EPA's list of Potentially Responsible Parties (PRPs) for Middle Waterway.** EPA has identified, and will continue to identify, PRPs for the Middle Waterway based on the liability criteria set forth in CERCLA Section 107. Finally, Ecology may make separate determinations in the future about whether additional facilities or properties that are contaminated, but do not appear to be sources to the Waterways, require investigation or cleanup under the Washington State Model Toxics Control Act.

If you have any questions regarding source control activities or the enclosed Status Reports, please contact me at (206) 553-0171 or Kris Flint at (206) 553-8155. If you would like other information about cleanup activities at the site, please call Elly Hale at (206) 553-1215 or toll free at 1-800-424-4EPA.

Sincerely,

A handwritten signature in black ink, appearing to read 'Christina Ngo', with a stylized flourish at the end.

Christina Ngo  
Superfund Project Manager

Enclosures

bcc (w/o encl.):

Elly Hale, ECL-115

Tod Gold, ORC-158

Kris Flint, ECL-113

Allison Hiltner, ECL-116

## Addressees

Beaverson, Chris  
Brown, Sharon  
Cagney, Pat  
Carman, Randy  
Citizens for Healthy Bay  
Clark, Bob  
Commencement Bay Cleanup Action Committee  
Davis, Clark  
Demich, Gary  
Dexter, Robert  
Dierich, Ginny  
DuBey, Richard  
Elliott, Valerie  
Gardner, Fred  
Glass, Greg  
Hertzog, Phil  
James, Kimberly  
Johannessen, Kim Maree  
Karavatis, G.S.  
Katich, Peter  
Kennedy, Mike  
Krausmann, Jeff  
Larkin, Karen  
Liegel, Konrad  
Lorbeir, Judith  
Malcom, Roderick  
McMillan, Russ  
Miller, Cheryl  
Musgrove, Nancy  
Nehring, Pamela  
Pugh, Bill  
Salazar, Mike  
Slocum, Tom  
Smith, Dave  
Sorrin, Leonard  
Spencer, John  
Stein, Barry  
Stivers, Carl  
Sullivan, Bill  
Tainer, Debbie

Taylor, Bob  
Um, Hyun  
Weiner, Ken  
Wilkinson, Kirk

Foss Maritime Company  
Marine Industries Northwest  
Pacific Yacht Basin  
Paxport Mills, Inc.  
Pioneer Painting Company  
Simpson Tacoma Kraft Company  
Union Pacific Railroad Company  
Washington Department of Natural Resources  
Western Machine Works, Inc.



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 2, 1997

Ms. Christina Ngo  
U.S. Environmental Protection Agency  
Region X  
1200 6th Avenue, HW-113  
Seattle, WA 98101-3188

Dear Ms. Ngo

Re: Source Control Status Report for the Middle Waterway Problem Area, Milestone  
3: Commencement Bay Nearshore/Tideflats Superfund Site

I have enclosed a report addressing source control Milestone 3 for the Middle Waterway Problem Area at the Commencement Bay Nearshore/Tideflats (CB/NT) Superfund Site. Milestone 3 is achieved when source control is complete for the major ongoing sources of problem chemicals to the Middle Waterway Problem Area.

The Milestone 1 Report for the Middle Waterway Problem Area (submitted to EPA 1/94) lists one major source: Marine Industries Northwest. The Milestone 2 Report for the Middle Waterway Problem Area (submitted to EPA 2/94) describes the administrative actions in place to control this major source. The Milestone 4 Report for the Middle Waterway Problem (sent concurrently with this report) describes administrative actions in place to control the other seven sources.

Sincerely,

Dave Smith  
Urban Bay Action Team Supervisor  
Toxics Cleanup Program  
Southwest Regional Office

DS:td

Enclosure

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Environmental Cleanup Office



### Milestone 3: Source Control Actions Complete for Major Sources

#### Introduction

This report identifies actions implemented to control major ongoing sources of problem chemicals to the Middle Waterway Problem Area. The Milestone 1 Report for the Middle Waterway Problem Area (submitted to EPA 1/94) lists one major source: Marine Industries Northwest (MINW). MINW is a ship repair facility located on the northwest shore of Middle Waterway at 313 East "F" Street.

Major sources are those that have been identified as such in the Commencement Bay Nearshore/Tideflats Record of Decision and the Integrated Action Plan. Control of the major sources is important because these sources are most directly linked with current sediment impacts. Milestone 2 (submitted to EPA 2/94) is achieved when all necessary administrative actions (e.g., permits, orders, decrees) are in place to control the major sources of problem chemicals to the Middle Waterway Problem Area.

The Milestone 4 Report for the Middle Waterway Problem (sent concurrently with this report) describes administrative actions in place to control the other seven sources.

1. Marine Industries Northwest (MINW) (major source; 313 East "F" Street)

#### History and Description of Site

Companies have been repairing, constructing and rebuilding vessels at 313 "F" Street on Middle Waterway since 1938. Foss Launch and Tug Company owned and operated a shipyard from 1938 through 1969 at the site. In 1969/70, Foss Launch and Tug Company was bought out and dissolved by Dillingham Corporation. Dillingham Corporation leased the site to Pederson Boat Company who conducted operations on the site until about 1980. Dillingham also formed a subsidiary called Foss Maritime, which only operated the tugs and barges (the site itself was controlled by the parent company). In 1981, Dillingham Corporation leased the site to Marine Industries Northwest (MINW). In 1987, Dillingham Corporation transferred the site to Foss Maritime. Foss Maritime has been leasing the site to MINW since the property transfer. Prior to boatyard/shipyard operations a saw mill was located on this property.

The site occupies approximately 4 acres with approximately 700 feet of waterfront. MINW's facility consists of: (1) an upland operation, (2) one marine railway that extends from the upland areas through a tidal zone to open water on Middle Waterway, and (3) a pier and a dry dock in Middle Waterway.

#### Site Activities

Vessels are either hauled onto a 600-ton capacity marine railway, berthed in a 2800-ton capacity drydock, or secured to the waterfront pier to conduct repairs or conversions. Vessels are sandblasted, washed, caulked, prepared for painting, welded, and painted. In addition, engines are overhauled. In a typical month, three steel-hulled vessels are repaired or converted.

All abrasive blasting, hydroblasting, and painting is carried out by Pioneer Painting, a subcontractor to MINW who works on-site. An individual NPDES permit for Pioneer Painting is not necessary because it is MINW's responsibility to educate subcontractors regarding environmental requirements.

#### Sources of Contamination

Before source control actions were implemented, MINW was an ongoing source of five problem chemicals to the Middle Waterway Problem Area: arsenic, copper, lead, mercury, and zinc. In addition, MINW was considered a major source of these problem chemicals to the Middle Waterway Problem Area.

Pathways included: (1) stormwater contaminated by copper, lead, and zinc above marine acute and chronic water quality standards; (2) groundwater seeps contaminated by copper, lead, zinc, and arsenic above acute and chronic water quality standards; and (3) stormwater solids (catch basin sediments) contaminated by mercury, arsenic, copper, lead, and zinc above Commencement Bay Sediment Quality Objectives.

Spent sand blast grit and paint chips that fell onto unpaved upland soil were carried by vehicle tires onto soil. Some of the metals from grit and paint chips that mix with the soil were discharged to the waterway via stormwater or subsurface groundwater seepage (primarily the latter). In addition, metals sloughed directly into the waterway when boats were relaunched after repair work was done, and hydroblasting of hulls would slough paint chips directly into the water.

#### Regulatory Requirements

Ecology uses its NPDES permitting authority to regulate activities at ship building and repair facilities that could pollute waters of the state.

In June 1992, Ecology issued a NPDES permit (No. WA-004044-4) addressing pollution control. The permit required implementation of best management practices (BMP's), and permit limits and monitoring for the following parameters in stormwater and hydroblasting wastewater: total recoverable (TR) copper, TR lead, TR zinc, oil and grease, total suspended solids, and pH.

Ecology then issued two permit modifications in May 1994 and December 1995, based on new information. The major modifications were as follows:

(1) Due to high total recoverable metal levels obtained from seep samples by Ecology after the permit was originally issued (data shown below), the modified permit required MINW to pave the site to prevent precipitation from seeping into contaminated soil and carrying metals into the waterway.

(2) The modified permit also required MINW to collect and treat stormwater after the site was paved. Ecology had sufficient evidence from other shipyards to show that stormwater runoff from paved active shipyards has high levels of copper and zinc despite implementation of best management practices.

MINW was required to submit a plan for collection and treatment and implement the plan. This plan is legally referred to as a "All Known and Reasonable Treatment" ("AKART") plan for stormwater. It also includes a description of best management practices. An AKART plan for pressure washing and hydroblasting is discussed under item 3 below.

The permit requirements relating to site paving and installation of a stormwater treatment system were also included in an Agreed Order issued under the Model Toxics Control Act (MTCA) in 1996 (Order # DE95TC-S362). The order was issued to streamline the shoreline permitting process; MTCA exempts cleanup actions under a MTCA order or decree from procedural (not substantive) requirements of local shoreline management plans.

(3) The modified permit prohibited the discharge of pressure wash and hydroblasting waste water until a system was developed to adequately treat or reuse the waste water. If MINW decided to pressure wash and hydroblast, they would first need to submit to Ecology a plan for Ecology's review and approval. If approved, the plan would be considered AKART for pressure washing and hydroblasting.

(4) Effluent limits for metals were temporarily removed from the permit in order to allow time for implementation of the AKART plan.

In January 1997, MINW submitted their application for renewal of their NPDES permit. Ecology expects to reissue the permit by February 1998. Until then, the expired permit remains effective and enforceable.

#### Source Control Activities

To meet the NPDES requirements and thereby control sources of problem chemicals to Middle Waterway, MINW took the following actions:

(1) In 1993, MINW installed a system to contain dust and overspray around the marine railway;

(2) In November, 1993, MINW submitted a BMP plan to Ecology, which Ecology approved in December 1993. By 1994, the BMP plan was fully implemented.

(3) In 1994, MINW built a shed to store spent grit under cover;

(4) In July, 1994, MINW submitted an AKART plan to Ecology for constructing a system to collect and treat all pressure and hydroblast wastewater. Ecology approved the plan in August 1994, and construction of the system was completed by December, 1994. Berms, scupper plugs, and collection sumps were installed on the lower part of the marine railway to route water to a large tank located on one side of the dry dock. The water is treated using chemical precipitation, and reused for hydroblasting. Precipitate from the treatment system is taken to a landfill (does not designate as hazardous waste).

(5) In May 1996, MINW submitted their AKART plan for paving and stormwater treatment, which Ecology approved a month later. By January 1997, the plan

was fully implemented to Ecology's satisfaction. In addition, the site was paved to prevent water from leaching metals from the contaminated soil into the waterway, and to allow stormwater to be conveyed to a treatment system. Precipitation that falls on the yard is routed first to a sedimentation basin and then discharged to a subsurface infiltration system. The sedimentation basin is designed to provide a 24-hr detention time for a 6-month storm event.

Data Demonstrating Source Control Effectiveness

MINW started collecting data to evaluate the effectiveness of the AKART solution in February 1997. By June 1997, Ecology determined that sufficient data were available to conclude that MINW is no longer a confirmed source of problem chemicals to Middle Waterway (see "Data Demonstrating Source Control Effectiveness" below). However, MINW continues to collect data that will be used by Ecology in reissuing the NPDES permit.

The table below provides data on stormwater and seep water quality before and after AKART was implemented. The stormwater data are from MINW's monthly NPDES permit data monitoring reports ("DMR"s) and the seep samples were taken and analyzed by Ecology.

Before AKART was implemented, stormwater was collected from outfall pipes. During construction of the AKART system, stormwater pipes were removed, and stormwater was routed to the subsurface infiltration system. Therefore, only seeps were sampled after AKART was implemented.

Problem Chemicals	Marine Water Quality Standards (ppb)		Metal Concentrations in Stormwater (totals; ppb)		Highest Metal Concentrations in seep water during low tide (ppb)	
	Acute	Chronic	Before Source Control (Average of monthly grabs, 1991-93)	After Source Control (5/97)	Before Source Control 3/93	After Source Control (5/97)
TR Copper	2.9	2.9	614.7	discharged to ground; seep data best represent water quality entering waterway	487.0	Below detection limit (<150)
TR Zinc	84.6	76.6	1014.6	"	865.0	Below detection limit (<20)
TR Lead	151.1	5.8	467.8	"	240.0	Below detection limit (<100)
TR Arsenic	69.0	36.0	<50.0	"	100.0 (estimate)	Below detection limit (<20)

Ms. Christina Ngo  
October 2, 1997  
Page 6

These data show a major decrease in metal concentrations in the seep samples. The detection limits were high for copper and lead due to sea water matrix interference, but the zinc and arsenic data suggest that all metals were likely below levels of concern.

Based on the work conducted by MINW and the data above, Ecology no longer considers MINW a confirmed source of problem chemicals to Middle Waterway.



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 2, 1997

Ms. Christina Ngo  
U.S. Environmental Protection Agency  
Region X  
1200 6th Avenue, HW-113  
Seattle, WA 98101-3188

Dear Ms. Ngo

Re: Source Control Status Report for the Middle Waterway Problem Area, Milestone  
4: Commencement Bay Nearshore/Tideflats Superfund Site

I have enclosed a report addressing source control Milestone 4 for the Middle Waterway Problem Area at the Commencement Bay Nearshore/Tideflats (CB/NT) Superfund Site. Milestone 4 is achieved when administrative actions are in place to control all confirmed ongoing sources of problem chemicals to the Middle Waterway Problem Area. These sources are listed in the Milestone 1 Report for the Middle Waterway Problem Area (dated January 31, 1994).

The report for Milestone 2 (administrative actions in place for major sources) was issued February 25, 1994. The Milestone 3 Report (source control actions complete for major sources) is being submitted concurrently with this report.

The approach to controlling sources of problem chemicals to the Middle Waterway Problem Area is provided in an EPA document titled "Source Control Strategy -- Commencement Bay Nearshore/Tideflats Superfund Site" (May 1992).

Sincerely,

Dave Smith  
Urban Bay Action Team Supervisor  
Southwest Regional Office  
Toxics Cleanup Program

DS:td

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Environmental Cleanup Office



#### Milestone 4: Administrative Actions in Place for All Confirmed Ongoing Sources

##### Introduction

Milestone 4 is met when administrative actions are in place to control all confirmed ongoing sources of problem chemicals to a CB/NT Waterway Problem Area. These sources are listed in the Milestone 1 Report for the Middle Waterway Problem Area (dated January 31, 1994). More sources may be found after sediment and bank remedial design sampling occurs (EPA lead effort).

The report for Milestone 2 (administrative actions in place for major sources) was issued February 25, 1994. The Milestone 3 Report (essential source control actions complete for major sources) is being submitted concurrently with this report.

The approach to controlling sources of problem chemicals to the Middle Waterway Problem Area is provided in an EPA document titled "Source Control Strategy -- Commencement Bay Nearshore/Tideflats Superfund Site" (May 1992).

##### 1. Marine Industries Northwest (MINW) (major source; 313 East "F" Street)

##### History and Description of Site

Companies have been repairing, constructing and rebuilding vessels at 313 "F" Street on Middle Waterway since 1938. Foss Launch and Tug Company owned and operated a shipyard from 1938 through 1969 at the site. In 1969/70, Foss Launch and Tug Company was bought out and dissolved by Dillingham Corporation. Dillingham Corporation leased the site to Pederson Boat Company who conducted operations on the site until about 1980. Dillingham also formed a subsidiary called Foss Maritime, which only operated the tugs and barges (the site itself was controlled by the parent company). In 1981, Dillingham Corporation leased the site to Marine Industries Northwest (MINW). In 1987, Dillingham Corporation transferred the site to Foss Maritime. Foss Maritime has been leasing the site to MINW since the property transfer. Prior to boatyard/shipyard operations a saw mill was located on this property.

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Ms. Christina Ngo  
October 3, 1997  
Page 3

All abrasive blasting, hydroblasting, and painting is carried out by Pioneer Painting, a subcontractor to MINW who works on-site. An individual NPDES permit for Pioneer Painting is not necessary because it is MINW's responsibility to educate subcontractors regarding environmental requirements.

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Ms. Christina Ngo  
October 3, 1997  
Page 6

These data show a major decrease in metal concentrations in the seep samples. The detection limits were high for copper and lead due to sea water matrix interference, but the zinc and arsenic data suggest that all metals were likely below levels of concern.

Based on the work conducted by MINW and the data above, Ecology no longer considers MINW a confirmed source of problem chemicals to Middle Waterway.

## 2. Foss Maritime (Cooks Marine) (223 East F Street)

Cooks Marine was located on the northeast corner of the peninsula between Middle Waterway and Thea Foss Waterway. It was a boat repair facility for 50 years until it ceased operations in March 1993. The property is owned by Foss Maritime. Activities that had a potential for releasing problem chemicals to Middle Waterway included hull washing, hull sandblasting, and painting. Ecology conducted inspections at the facility before and after Cooks Marine ceased operations (January and September, 1993). In January 1993, Cooks Marine was using tarps to contain spent sandblast grit and paint waste. However, a paint storage area located in a shed overlying the water had no spill control structures.

Ecology also observed a pile of metal turnings beneath the dock. The turnings could not be sampled due to their location, but Ecology considered the loose, friable material a potential source of metal contamination to Middle Waterway. Ecology asked the land owner, Foss Maritime, to remove the metal debris in 1993. Foss Maritime removed the friable portions of the metal debris pile voluntarily in 1994 to Ecology's satisfaction, based on visual observation.

Ecology also observed spent sandblast grit deposited near the shore of the peninsula about 350 feet from Middle Waterway. Due to the distance from Middle Waterway, Ecology does not believe the grit or runoff from the grit was a source of problem chemicals to the Middle Waterway Problem Area. However, Ecology encouraged Foss to remove the grit, which the company accomplished to Ecology's satisfaction in 1994, based on visual observation.

This site is no longer considered a confirmed source of problem chemicals to the Middle Waterway Problem Area.

## 3. Jack Carlyle Trucking (639 East "F" Street)

In 1993 Ecology inspected this property, which is currently used by Mr. Carlyle for repairing and equipment. The property is owned by Foss Maritime and mostly paved. Ecology observed no evidence of ongoing activities that would release problem chemicals to Middle Waterway. However, Ecology did observe improper storage of drums, one of which apparently contained solvents. Ecology alerted Mr. Carlyle that all drums containing petroleum products, solvents, and hazardous waste must be stored inside a building or in a bermed and covered area. Ecology observed no evidence of sandblasting, and Mr. Carlyle indicated that he did not sandblast at the site.

The site drain system is private, drains to one outfall, and includes seven catch basins. Most of the drainage system is inoperable because it is plugged up. In 1993, Ecology sampled intertidal sediments below the outfall, sediments in the catch basin closest to the waterway, and soil from the bank near the outfall for problem chemicals. The intertidal sediment sample was composited from surface sediments (top 10 cm) over a stretch of about 5 feet where it appeared that the flow from the outfall drained. The outfall projects from the bank about six feet from the sediments.

The intertidal sediment sample contained several organic chemicals exceeding Commencement Bay Sediment Quality Objectives (CBSQO's) and zinc slightly exceeding its CBSQO. The catch basin sediment sample contained zinc substantially above its CBSQO, but contained none of the organic chemical exceedances seen in the intertidal sediment sample. Based on this lack of correspondence and the lack of any ongoing activities suggesting a release of chemicals to the drain system, Ecology decided that the site was, in fact, not a source of problem chemicals to the waterway. However, Ecology requested that Mr. Carlyle clean out his catch basins, which he accomplished voluntarily under Ecology supervision in 1994.

The bank sample contained zinc above its CBSQO, but the exceedance was not large enough to justify a source control action. The data are presented below. Numbers in bold indicate exceedances of CBSQO's. Detection limits varied depending on the nature of interfering chemicals in the matrices.

Problem Chemicals Exceeding CBSQO's in one or more sample	Sediments from Catch Basin Closest to Outfall (ppm)	Bank Sample Near Outfall (ppm)	Intertidal Sediment Sample Below Outfall (ppm)	CBSQO (ppm)
Arsenic	684	33.5	38.5	57
Cadmium	8.6	Not analyzed	not analyzed	5.1
Copper	1590	258	331	390
Lead	1090	278	279	450
Mercury (dry weight)	0.237	0.210	1.759	0.59
Zinc	5900	1160	731	410
LPAH's	2260	5179	15584	5200
HPAH's	2673	13500	54990	17000
1,2-Dichloro-benzene	1/	2/	1230	50
1,4-Dichloro-benzene	1/	2/	883	110
4-methylphenol	1/	2/	589	63

1/Below detection limit of 740 ppm (base neutral acid scan only)  
 2/Below detection limit of 2060 ppm (base neutral acid scan only)

3. Coast Craft (1002 East F St.)

The property at 1002 East F Street lies between Middle Waterway and "F" Street. It is currently occupied by Fletcher Construction, and there are no activities at the site that could release problem chemicals to Middle Waterway. Before 1996, Coast Craft made unfinished cabinetry at this address, and before 1991 activities associated with wood treating took place. Ecology inspected the property in 1992 and found no evidence of problem chemicals being released to Middle Waterway from ongoing activities. In 1993 and 1994, Ecology sampled sediments from on-site stormwater catch basins and marine sediments below the site's only stormwater outfall, which only drains the Coast Craft property between Middle Waterway and "F" Street. Ecology found pentachlorophenol in both catch basin and marine sediments at about double the Commencement Bay Sediment Quality Objective (CBSQO). Pentachlorophenol is a problem chemical for Middle Waterway. The chemical was presumed to be in the catch basins due to pre-1991 activities.

Ecology listed Coast Craft on the Milestone 1 Report for Middle Waterway as a confirmed source of problem chemicals to the waterway due to the pentachlorophenol in the storm drain lines. In 5/96, EPA signed a prospective purchaser agreement with a new owner of the property (Mylet Family Limited Partnership #1) for sediment liability associated with the property. The agreement also included a requirement to clean out the storm drain lines.

Very shortly after the agreement was signed, all existing drain lines and catch basins were excavated and replaced by new lines. This site is no longer considered an ongoing source of problem chemicals to Middle Waterway.

[NOTE: Although not a confirmed source of problem chemicals to Middle Waterway, property previously owned by Coast Craft on the other side of "F" Street was also cleaned up to Ecology's satisfaction in 1996 under a MTCA independent cleanup action ("IRAP"). EPA included a monetary incentive to have this cleanup conducted in their pre-purchaser agreement with the Mylet Family Limited Partnership #1.]

5. Brass Foundry Debris Site (bank at head of waterway)

In the past (dates uncertain), two brass foundries operated between 11th Street and the head of Middle Waterway, just east of storm drain 200. The companies were Ball Brass and Tacoma Brass. No evidence of the foundries existed when Ecology inspected the property in 1993, with the exception of metal castings and other metal debris lying along the bank. The property currently is owned by Simpson Tacoma. Ecology sampled the bank soils and debris for chemical analyses in 1993, and found exceedances of Commencement Bay Sediment Quality Objectives for all problem metals except mercury (copper, arsenic, zinc, and lead). Concentrations from three samples ranged from 20-128 ppm for arsenic (CBSQO is 57 ppm), 973-2410 ppm for copper (CBSQO is 390 ppm), 38-6630 ppm for lead (CBSQO is 450 ppm), 107-2950 ppm for zinc (CBSQO is 450 ppm), and 0.0254-0.127 ppm dry weight for mercury (CBSQO is 0.59 ppm).

In 1994 Simpson Tacoma conducted a voluntary investigation of the bank area. To prepare for the cleanup, test pits were dug and soil samples were analyzed from the pits in 1993 to determine the horizontal and vertical extent of metal-contaminated soil and metal debris.

In September, 1993, a plan was developed to over-excavate the contaminated soil and debris and relocate it upland near 11th Street behind a berm and beneath a layer of clay. This plan was integrated into a waterway restoration effort overseen by the Natural Resource Damage Assessment Trustees (NRDA). The NRDA trustees include Ecology, Washington State Department of Fish and Wildlife, Washington State Department of Natural Resources, National Oceanic and Atmospheric Administration, the Puyallup and Muckleshoot Tribes, and the federal Department of Fish and Wildlife. The plan was titled "Project Analysis -- Middle Waterway Shore Restoration Project", authored by Simpson Tacoma Kraft and Champion International, and dated September 1993. The plan included the following:

- over-excavate the contaminated soil and metal debris (150 cubic yards);
- place the contaminated soil and debris beneath a one-foot layer of clay on the upland portion of the property (close to 11th Street) at an elevation of 18 ft MLLW and cover the clay with clean fill;
- construct a berm 15 ft wide, 5 feet high, and 125 feet long with 2:1 side slopes constructed of clean fill immediately in front of the confined contaminated soil;
- fill in the excavation area along the bank with clean fill at a 2:1 slope;
- plant the intertidal and upland areas with riparian vegetation.

The clay layer and berm were installed to isolate the contaminated soil and debris from precipitation, to keep contaminated soil from eroding into the waterway, and to minimize transport of dissolved metals via groundwater into the waterway. Leach tests on the contaminated soil indicated that leaching was not a potentially significant problem, but the clay cap was included as an extra precaution to preclude the need for post-cleanup monitoring.

The plan was successfully implemented in 1995. This site is no longer considered an ongoing source of problem chemicals to Middle Waterway.

#### 6. Steel Foundry Debris Site (bank at SW corner of waterway)

In the past (dates uncertain), two metal working facilities operated adjacent to the bank of Middle Waterway at the waterway's southwest corner, just west and north of storm drain 200. The companies were Tennent Steel/Western Steel Casting (steel foundries), and Tsungani Piston (aluminum/alloy piston casting facility). No evidence of the foundries existed when Ecology inspected the area in 1993, with the exception of metal debris along the banks. The property

is owned by the Washington State Department of Natural Resources and the City of Tacoma Public Works Department. Ecology sampled the bank soils and debris for chemical analyses in 1993, and found exceedances of Commencement Bay Sediment Quality Objectives for all problem metals except mercury. In addition, one sample contained elevated HPAH. Concentrations were 179 ppm for arsenic (CBSQO is 57 ppm), 3580 ppm for copper (CBSQO is 390 ppm), 1010 ppm for lead (CBSQO is 450 ppm), 476 ppm for zinc (CBSQO is 450 ppm), 19,818 ppm for HPAH (CBSQO is 17,000 ppm), and 0.054 ppm dry weight for mercury (CBSQO is 0.59 ppm).

This site is also the City of Tacoma's Middle Waterway Estuarine Natural Resources Restoration Project. The restoration project, scheduled to be completed by September of 1998, will involve excavation of much of the upland area to create new intertidal lands. In preparation for the project, the City of Tacoma obtained eight bank samples and several samples from trenches and test pits on the upland. The bank samples were found to contain levels of LPAH, HPAH, copper, lead, mercury, nickel, zinc, and PCB above Commencement Bay Sediment Quality Objectives. The upland trench samples contained carcinogenic PAH above the MTCA method A cleanup levels. Further detail is found in two reports issued by the City of Tacoma:

(1) Middle Waterway Estuarine Natural Resources Restoration - Project Concept Plan, Sampling and Analysis Plan. Appendix A to the City of Tacoma Natural Resource Damages Consent Decree. City of Tacoma, October 1996.

(2) Middle Waterway Estuarine Natural Resources Restoration Project - Site Characterization Report Appendices. City of Tacoma, January 1997.

Much of the upland and all of the existing banks (where metal slag is found) will be removed as a part of the restoration project. Ecology anticipates that all site source control and MTCA issues will be negotiated and resolved through review of construction documents. Once the contaminated material is removed, fill material suitable for wetland restoration work will be used to complete the restoration project.

#### 7. Sandblast Grit on Bank, Head of Waterway

In 1993, Ecology observed sand blast grit on the bank of Middle Waterway immediately to the north of storm drain 200 and in front of Pacific Yacht Basin. This grit will be removed as part of the cleanup of the adjacent Steel Foundry Debris site, which is also the City of Tacoma's Middle Waterway Restoration Project (see "Steel Foundry Debris Site").